PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

M&E Of Yearling Snake R. Fall Chinook Released Upstream Of Lower Granite

BPA project number: 9801004
Contract renewal date (mm/yyyy): 1/2000 ☐ **Multiple actions?**

Business name of agency, institution or organization requesting funding
Nez Perce Tribe Department of Fisheries Resources Management

Business acronym (if appropriate) NPT

Proposal contact person or principal investigator:

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NPPC Program Measure Number(s) which this project addresses
7.0A, 7.3B.2, 7.5B.1

FWS/NMFS Biological Opinion Number(s) which this project addresses
Section X. Conservation Recommendations A. 1,2,3 NMFS Biological Opinion for 1995 to 1998 Hatchery Operations in the Columbia River Basin.

Endangered Species Act, Section 7

Other planning document references
Proposed Recovery Plan for Snake River Salmon (March, 1995), 4.1.d. "To determine if supplementation can assist in fall chinook recovery, the management plan for Lyons Ferry Hatchery should call for supplementation and be carefully evaluated in areas above Lower Granite Dam." The Wy-Kan-Ush-Mi Wa-Kish-Wit (June, 1995 p. 3-20), states that "… the increase in survival and reproduction capacity gained through the use of artificial propagation in supplementation and reintroduction programs is necessary to recover stocks in a timely fashion" and P.5B-25 recommends to: "develop experimental and monitoring programs in association with these projects." Page 98-99 recommends to

"Begin a fall chinook supplementation program using Lyons Ferry stock, develop adult capture and juvenile acclimation/release facilities in the Asotin Creek and Pittsburg Landing areas on the Snake River...and monitor and evaluate all artificial production actions."

Short description
Monitor and evaluate fish health, movement patterns, migration timing, travel times, juvenile emigration survival and adult returns through supplementation of Lyons Ferry Hatchery fall chinook salmon in the Snake and Clearwater rivers.

Target species
Snake River Fall Chinook Salmon (Oncorhynchus tshawytscha)

Section 2. Sorting and evaluation

Subbasin
Lower Snake Mainstem, Clearwater

Evaluation Process Sort

CBFWA caucus	Special evaluation process	ISRP project type
Mark one or more caucus	If your project fits either of these processes, mark one or both	Mark one or more categories
☒ Anadromous fish ☐ Resident fish ☐ Wildlife	☐ Multi-year (milestone-based evaluation) ☐ Watershed project evaluation	☐ Watershed councils/model watersheds ☐ Information dissemination ☐ Operation & maintenance ☐ New construction ☒ Research & monitoring ☐ Implementation & management ☐ Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description
20541	Snake River Fall Chinook Salmon Studies
9102900	Life History and Survival of Fall Chinook Salmon in the Columbia R. Basin
9302900	Survival Estimates for Passage of Juv. Salmonids Through Dams and Reservoir
9403400	Assessing Summer and Fall Chinook Restoration in the Snake River Basin
9801003	Monitor and Evaluate Spawning Distribution of Snake R. Fall Chinook Salmon

9801004	M&E of Yearling Snake R. Fall Chinook Released Upstream of L. Granite Dam
9801005	Pittsburg Ldg., Capt. John Rapid, & Big Canyon Fall Chinook Acclimation Fac

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
9403400	Assessing Summer/Fall Chinook Restoration in the Snake River Basin	9801004 depends on 9403400 for conducting adult fall chinook spawning ground surveys and carcass recovery to determine hatchery fish spawning contribution and for use of a jet boat for juvenile chinook telemetry in the Snake River and tributaries.
9403400	Assessing Summer/Fall Chinook Restoration in the Snake River Basin	9403400 depends on 9801004 for one full time biologist to assist in seining and collection of juvenile fall chinook.
9801003	Monitor and Evaluate Yearling Snake River Fall Chinook Released Upstream of	9801004 depends on 9801003 for radio tagging adult fall chinook at Lower Granite Dam and conducting adult fall chinook spawning ground surveys, carcass recovery, and fall chinook adult mobile and fixed telemetry in Snake River and tributaries.
9801005	Pittsburg Ldg., Capt. John Rapid, & Big Canyon Fall Chinook Acclimation Fac	9801004 depends on project 9801005 to acclimate 150,000 supplementation yearlings from each facility for release into the Snake River basin.
8335000	Nez Perce Tribal Hatchery	Hatchery supplementation program to assist in the recovery of fall chinook salmon in the Clearwater River sub-basin.

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1998	PIT tagged and released 9,942 yearling chinook at the Pittsburg Landing facility, 7,458 at the Big Canyon facility, and	Survival estimates are currently being calculated. Migration timing analysis has been completed.

	1,253 at the Captain John Rapids facility in cooperation with the USFWS and WDFW.	
1998	Radio tagged and released 50 yearling chinook at each the Pittsburg Landing, Big Canyon Creek, and Captain John Rapids facilities.	Yearling radio tracking included 21 boat days and 8 fixed wing flights. Migration characterictics are currently being analyzed.
1998	Yearling chinook health assessments were performed at the Pittsburg Landing, Big Canyon Creek, and Captain John Rapids facilities by the USFWS.	Health assessments are being compiled by the USFWS.
1998	62 adult fall chinook from the acclimation facilities were radio tagged at Lower Granite Dam by the USFWS.	The NPT conducted 14 adult radio tracking fixed wing flights. Migration characteristics are being analyzed by the USFWS.
1997	PIT tagged and released 9,916 yearling chinook at the Pittsburg Landing facility and 10,051 at the Big Canyon facility in cooperation with the USFWS and WDFW.	Survival estimates (using the SURPH model) from Big Canyon and Pittsburg Landing to Lower Granite Dam ranged from 88.8-97.0% and 90.0-94.3% respectively.
1997	Radio tagged and released 98 yearling chinook at the Pittsburg Landing facility and 97 at Big Canyon Creek.	Yearlings were tracked by boat and fixed wing aircraft. Data are being analyzed.
1997	Yearling chinook health assessments were performed at the Pittsburg Landing and Big Canyon Creek facilities by the USFWS.	Health assessments are being compiled by the USFWS.
1997	16 adult fall chinook from the acclimation facilities were radio tagged at Lower Granite Dam by the USFWS.	The NPT conducted fixed wing adult tracking flights. Migration characteristics are being analyzed by the USFWS.
1996	PIT tagged and released 12,421 yearling chinook at the Pittsburg Landing facility in cooperation with the USFWS.	Survival estimates are currently being calculated. Migration timing analysis has been completed.

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Monitor, evaluate and compare pre-release and release health conditions of yearling Lyons Ferry Hatchery fall chinook acclimated and released at Pittsburg Landing and Captain Johns Rapid on the Snake River	a	Assist the Dworshak Hatchery Fish Health Lab in conducting weekly health assessments on a sample of 100 fish at each the Pittsburg Landing, Captain John Rapids, and Big Canyon Creek acclimation facilities.

	and at Big Canyon Creek on the Clearwater River.		
1		b	Document fish size and condition factor on fish sampled in Task 1.a and during PIT tagging (Task 2.h).
1		c	Using data from Tasks 1.a and 1.b compare fish size and condition of fish reared at Big Canyon, Pittsburg Landing, Captain John Rapids, and LFH.
1		d	Check a representative sample of 1,500 fish for elastomer tag retention at Big Canyon Creek and Pittsburg Landing while PIT tagging (Task 2h) and assist the WDFW in checking elastomer tag retention while PIT tagging at Captain John Rapids.
2	Monitor, evaluate, and compare post-release behavior, migration timing, and survival of yearling fall chinook released at Pittsburg Landing, Captain Johns Rapid, and Big Canyon Creek.	a	Radio tag 50 PIT tagged fall chinook yearlings each at Pittsburg Landing, Captain John Rapids, and Big Canyon Creek acclimation facilities one day prior to release and monitor post-release dispersal and movement patterns
2		b	Place fixed radio receivers at the downstream end of the free-flowing stretch of the Snake and Clearwater Rivers and at Lower Granite and dam and monitor movement patterns and migration rates in the free-flowing and impounded reaches of these systems.
2		c	Coordinate with the NPT, USFWS, BRD, University of Idaho (UI), and WDFW on radio telemetry equipment and data collection positions that may be shared for this study.
2		d	Monitor individual fish locations by fixed-wing flights and boat and/or mobile tracking every day for four weeks after release from various locations to Little Goose Dam and plot locations using GPS and detailed navigational maps.

2		e	Coordinate with BRD on obtaining radio telemetry equipment from their discontinued study at Lower Granite dam in order to collect telemetry data on radio tagged yearling fall chinook.
2		f	Compile temperature and discharge data in the Snake and Clearwater Rivers, and in Lower Granite Reservoir and supplement thermographs where needed.
2		g	Evaluate fish distribution and travel times in relation to environmental variables (water temperature, discharge, etc.).
2		h	PIT tag up to 10,000 fall chinook yearlings (2,500 X 4 replicate groups) acclimated at Big Canyon Creek and Pittsburg Landing and assist the WDF in PIT tagging comparable numbers at the Captain John Rapids facility.
2		i	Compile and analyze PIT tag detection data at mainstem dams and compare arrival timing, mean detections dates and travel times for the fish released at Big Canyon Creek, Pittsburg Landing, Captain John Rapids and PIT tag releases at LFH.
2		j	Evaluate the effect of fish size on travel time from Big Canyon Creek and Captain John Rapids to Lower Granite Dam by partitioning release fork lengths in 5 mm increments and analyze using analysis of variance (ANOVA).
2		k	Use the PIT tag database compiled for Task 2.i. and the Survival Under Proportional Hazards (SURPH) model to estimate fish survival from the Pittsburg Landing, Big Canyon Creek, and Captain John Rapids releases
3	Monitor and compare contribution and distribution of	a	Assist 9403400 collecting adult carcasses in spawning areas on the

	adult returns and smolt-to-adult survivals of yearling fall chinook released from Pittsburg Landing, Captain Johns Rapid, and Big Canyon Creek.		Clearwater, Salmon, and Grande Ronde Rivers to recover CWT and elastomer data from supplementation or hatchery released fish and gather percent spawned data to estimate spawning success.
3		b	Assist USFWS in radio tagging adult fall chinook at Lwr Granite and monitor adult movements in Lwr Granite and Little Goose Reservoirs weekly by fixed wing flights from Sep. through Dec. and provide locations to USFWS for data analysis.
3		c	Assist project 9403400 in conducting aerial spawning surveys on the Clearwater, Salmon, and Grande Ronde Rivers and provide locations to project 9801003 to analyze adult movements and locations of radio tagged supplementation fish.
3		d	Based on the above activities, cooperate with project 9801003 estimate the total redd contribution in the Clearwater, Grande Ronde, and Salmon Rivers by supplemented fall chinook released at acclimation facilities and those released at LFH.
3		e	Coordinate with the WDFW and USFWS in compiling the adult recovery information to estimate and compare smolt-to-adult survivals from yearling releases at Pittsburg Landing, Captain John Rapids, Big Canyon Creek, and releases at LFH.
4	Prepare a cooperative annual report with the USFWS and WDFW that evaluates the success of supplementation of yearling fall chinook above Lower Granite Dam.	a	Provide project status reports on a quarterly basis. Quarterly reporting requirements are detailed in the BPA Terms and Conditions
4		b	Write an annual report on the results

			of all objectives and tasks outlined in this statement of work and coordinate and review reports with the USFWS and WDF to combine into a comprehensive annual report.
4		c	Evaluate the success of the supplementation of LFH yearlings above Lower Granite Dam to increase natural production and assess potential impacts to natural fall chinook populations and productivity.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	3/2000	4/2000	Yearling health assessments		1.00%
2	1/2000	10/2000	Yearling emigration survival estimates and behavior		50.00%
3	9/2000	12/2000	Adult migration characteristics		13.00%
4	6/2000	1/2001	Annual reporting		36.00%
				Total	100.00%

Schedule constraints
Obtaining enough fall chinook yearlings from Lyons Ferry Hatchery to continue supplementation at each of the three acclimation facilities above Lower Granite Dam for at least ten consecutive years. Inclement weather can constrain telemetry activities.

Completion date
2014

Section 5. Budget

FY99 project budget (BPA obligated): $301,039

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	Project Leader, Admin. Support are	%34	92,850

	taxed status. Biologist, Aide, and Secretary are non-taxed.		
Fringe benefits	27% on taxed staff 12% on non-taxed staff	%7	19,096
Supplies, materials, non-expendable property	Misc. office supplies, field materials.	%2	4,900
Operations & maintenance	Office rent, utilities, telephone services, GSA vehicle, boat gas and maintenance, training.	%6	16,994
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	Coded radio tags, personal computer.	%13	34,500
NEPA costs		%0	0
Construction-related support		%0	0
PIT tags	# of tags: 20,000	%21	58,000
Travel	Airfare, vehicle rental, travel per diem, field per diem.	%1	1,950
Indirect costs	22.9% of direct costs (all except equipment and subcontracts).	%11	31,108
Subcontractor	Yearling and adult chinook fixed wing aircraft telemetry flights.	%5	13,400
Other		%0	0
TOTAL BPA FY2000 BUDGET REQUEST			$272,798

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount ($)
		%0	
		%0	
		%0	
		%0	
Total project cost (including BPA portion)			$272,798

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	$275,000	$280,000	$285,000	$290,000

Section 6. References

Watershed?	Reference

☐	Rondorf, D.W., and K.F. Tiffan. 1996. Identification of the spawning, rearing and migratory requirements of fall chinook salmon in the Columbia River Basin. Annual Report 1994. DOE/BP-21078-4, Bonneville Power Administration, Portland, Oregon.
☐	Arnsberg, B.D., Connor, W.P., and Connor, E.J. 1992. Mainstem Clearwater River study: Assessment for salmonid spawning, incubating, and rearing. Final Report. DOE/BP-37474-3, Bonneville Power Administration, Portland, Oregon.
☐	Arnsberg, B.D., and S.J. Rockledge. 1998. M & E of yearling Snake River fall chinook salmon outplanted upstream of lower Granite Dam. In proceedings of the Lower Snake River Compensation Plan Status Review Symposium. USFWS, Boise, ID. Sep. 1998.
☐	Smith, S.G., J.R.Skalski, J.W. Schlechte, A. Hoffmann, and V. Cassen. 1994. Statistical survival analysis for fish and wildlife tagging studies. Manual submitted by Center for Quantitative Science, School of Fisheries, University of Washington

PART II - NARRATIVE

Section 7. Abstract

Fall chinook supplementation above Lower Granite Dam consists of acclimating and releasing 150,000 Lyons Ferry yearling fall chinook at facilities at Pittsburg Landing, Big Canyon Creek, and Captain John Rapids. This proposal will continue the cooperative study to monitor and evaluate fall chinook released above Lower Granite Dam as recommended in the *FWP*, *NMFS Proposed Recovery Plan* and *Wy-Kan-Ush-Mi Wa-Kish-Wit*.

We will monitor, evaluate, and compare pre-release and release conditions, post-release behavior, migration timing, survival to Lower Snake River dams, contribution and distribution of adult returns and smolt-to-adult survivals of yearling hatchery fall chinook released at the acclimation facilities with each other and with releases at Lyons Ferry Hatchery (LFH).

A representative sample of all release groups will be PIT tagged and radio tagged at each acclimation facility and released at similar sizes and times as releases at LFH. Size and condition of PIT tagged fish will be evaluated during migration for fish recaptured through beach seining in the Snake and Clearwater Rivers. Outmigration survival will be estimated from PIT tag interrogations at mainstem dams using the Survival Under Proportional Hazards (SURPH) model. Post-release dispersal and outmigration behavior will be assessed using radio telemetry. We will assist the LFH program in their evaluation of Snake River Basin fall chinook smolt-to-adult survivals and adult contributions and distribution by monitoring the supplementation yearlings.

Section 8. Project description

a. Technical and/or scientific background

The primary historical spawning range of fall chinook salmon extended into the uppermost accessible reaches of the Snake River basin. The Hells Canyon hydroproject complex limited spawning range to the areas below Hells Canyon dam.

Historical estimates of Snake River fall chinook abundance averaged 72,000 annually between 1938 and 1949 and declined to 29,000 from 1950 through 1959. The decline continued to 12,700 annually at Ice Harbor Dam from 1964 through 1968, 3,400 at Lower Granite Dam from 1969 through 1974, and only 600 at Lower Granite Dam from 1975 through 1980 (*NMFS Proposed Recovery Plan*). Recent abundance at Lower Granite Dam has ranged from a low of 78 fish in 1990 (SRSRT 1994) to a high of 1,904 (as of 11/18) in 1998.

The FWP goal is “a healthy Columbia River Basin”, in part, through ecological health assessment, support of native species in native habitat, assessment of program measures, and learning from implementation. The *NMFS Proposed Recovery Plan* recommends to “implement, with careful monitoring and evaluation, those actions that are necessary for the immediate conservation and recovery of the species...”, in part, through improvements in downstream survival through flow and spill management, modification of dams and operations for juvenile and adult salmon passage, and controlled propagation to preserve stocks.

Lyons Ferry Hatchery was built in 1982 below Little Goose Dam on the Snake River as part of the Lower Snake River Compensation Plan. Lyons Ferry Hatchery fall chinook salmon stock was originally of Snake River origin and is currently the only hatchery program for Snake River fall chinook. The goal of the hatchery program is to "restore dam-related losses of wild steelhead and chinook salmon." The *NMFS Proposed Recovery Plan, Wy-Kan-Ush-Mi Wa-Kish-Wit*, and FWP specifically call for fall chinook supplementation with monitoring and evaluation above Lower Granite Dam.

Supplementation with 122,000 yearlings in the Snake River above Lower Granite Dam at Pittsburg Landing began in the spring of 1996. Agreements were reached through U.S. v. Oregon to release 150,000 yearlings at each of three acclimation facilities (450,000 total) above Lower Granite Dam in future years. The acclimation facility at Big Canyon Creek on the Clearwater River came on line in 1997 and a third facility at Captain John Rapid is came on line in 1998.

The purpose of this proposal is to continue the cooperative study to monitor and evaluate Lyons Ferry Hatchery fall chinook released above Lower Granite Dam as recommended in the *FWP, NMFS Proposed Recovery Plan* and *Wy-Kan-Ush-Mi Wa-Kish-Wit*.

b. Rationale and significance to Regional Programs

Suitable spawning habitat is available, and partially utilized, in the Clearwater and Snake Rivers above Lower Granite Dam (Arnsberg et al. 1992, Rondorf and Tiffin 1996) and should be considered for natural reproduction development (Arnsberg et al. 1992). Supplementation of fall chinook above Lower Granite Dam was initiated for immediate conservation and future recovery of fall chinook in their native habitat. The project objectives of monitoring fish health, survival, and behavior in relation to various environmental and management conditions relate directly to the FWP objective of "a healthy Columbia River Basin", in part, through basin ecological health assessment, support of native species in native habitat, assessment of program measures, and learning from implementation (adaptive management).

The FWP calls for an adaptive management approach which involves monitoring and evaluation of implemented programs. This project will evaluate the success of fall chinook supplementation above Lower Granite Dam and facilitate management decisions for the future conservation and perpetuation of naturally spawning populations of fall chinook salmon in the Snake and Clearwater Rivers above Lower Granite Dam.

Cooperation will continue with the WDFW, USGS, and the USFWS in this supplementation monitoring and evaluation effort. Cooperation will include transportation of fish from Lyons Ferry Hatchery to the Snake and Clearwater acclimation facilities, conducting fish health assessments, PIT tagging, monitoring of juvenile performance and evaluation of adult returns over Lower Granite Dam and their contribution to natural production. Radio receivers will be borrowed from the WDFW and the USGS will collect yearling location data in Lower Granite Reservoir and dam through their fixed receiver locations for other studies.

c. Relationships to other projects

See umbrella proposal "Snake River Fall Chinook Salmon Studies."

This project complements and collaborates with several other FWP projects. Foremost is BPA project 9801005, Pittsburg Landing, Captain John Rapids, and Big Canyon Fall Chinook Acclimation Facilities. Our project conducts monitoring and evaluation on the supplementation yearling fall chinook which are acclimated at and released from these facilities. Close cooperation is required between the projects for PIT and radio tagging efforts.

This project works in close collaboration with the NPT project (BPA project 9403400) assessing summer/fall chinook restoration in the Snake River Basin. These projects share personnel, equipment, and vehicles.

The USFWS (project 9102900) also complements this project by studying fall chinook life histories in the Columbia River Basin.

In 1997 and 1998 this project relied heavily on the USGS Biological Resources Division (BRD). The BRD operated many fixed telemetry antennas and receivers at Lower Granite Dam. In addition to collecting their own radio tracking data, the BRD collected

and provided telemetry data at Lower Granite Dam on radio-tagged fish from this project. This BRD project was discontinued for 1999, but may be reinstated for 2000.

This project collaborates with USFWS, WDFW, University of Idaho, and the NPT fall chinook assessment project to monitor adult fall chinook escapement and spawning distribution. The USFWS (project 9801003) coordinates telemetry and spawning ground survey activities for supplementation adults returning past Lower Granite Dam. The WDFW complements this project by monitoring and evaluation of fall chinook released at Lyons Ferry Hatchery. Each project conducts a portion of the monitoring effort. This project performs aerial telemetry on the Lower Snake reservoirs, the UI operates mobile and fixed site telemetry on the upstream of Lower Granite reservoir, WDFW performs mobile telemetry, and USFWS and NPT perform aerial telemetry, spawning ground surveys, and carcass collection upstream in the Snake and Clearwater Rivers.

d. Project history (for ongoing projects)

The first two years of this project, 1996 and 1997, were funded through the USFWS Lower Snake River Compensation Plan by BPA. In 1998 direct BPA funding began. Supplementation of Lyons Ferry Hatchery fall chinook yearlings and monitoring and evaluation studies were initiated on the Snake River at the Pittsburg Landing acclimation facility constructed by the U.S. Army Corps of Engineers in 1996. During 1997, a second acclimation facility was constructed and operated at Big Canyon Creek on the lower Clearwater River. A third acclimation facility at Captain John Rapids on the Snake River began operation to acclimate fall chinook in 1998. These three facilities are sufficient to acclimate a total of 450,000 Lyons Ferry Hatchery fall chinook (150,000 at each of the three facilities).

The only acclimation facility on line in 1996 was Pittsburg Landing. Monitoring and evaluation funding was minimal. The only funding consisted of LSRCP provided PIT tags. Labor for tagging was cost shared by NPT and USFWS. The Big Canyon facility came on line in 1997 and monitoring and evaluation received funding of $138,500. This budget included biologist and technician salaries for six months, but did not include any PIT tag costs. The project was funded at $180,000 in 1998 (excluding PIT tag costs) which included full year salaries for project staff.

Results from the 1996, 1997, and 1998 monitoring and evaluation of yearling fall chinook released at Pittsburg Landing on the Snake River were encouraging. Fish health assessments were favorable for fish releases, mortality during the six week acclimation period was low (1998 mortality was somewhat higher due to high incidence of BKD), and 1997 survival rates from PIT tagged fish were higher than expected to the Snake and Columbia River dams.

This project promotes adaptive management by evaluating fall chinook survival and behavior during various environmental conditions and management regimes (controlled flows, etc.).

We are currently working with the USFWS and WDFW on a cooperative annual report on monitoring and evaluation of yearling fall chinook acclimated and released in 1998. A poster of 1997 results was presented at the LSRCP Status Review Symposium in February, 1998 (Arnsberg and Rockledge 1998).

e. Proposal objectives

The critical assumption of this project is that limiting factors affecting survival of Snake River chinook salmon will be addressed in the near future.

Objective 1: Monitor, evaluate, and compare pre-release and release conditions of yearling hatchery fall chinook released at the Pittsburg Landing, Big Canyon Creek, and Captain John Rapids acclimation facilities with on-station releases at Lyons Ferry Hatchery (LFH).

Ho1: Pre-release and release conditions will be the same for yearling hatchery fall chinook released from Pittsburg Landing, Captain John Rapid, Big Canyon Creek, and Lyons Ferry Hatchery. Corollary: A detectable difference in pre-release and release conditions will be observed between yearling fall chinook released from Pittsburg Landing, Captain John Rapid, Big Canyon Creek, and Lyons Ferry Hatchery.

Objective 2: Monitor, evaluate, and compare post-release behavior, migration timing, and survival of yearling fall chinook released at Pittsburg Landing, Big Canyon Creek, Captain John Rapids, and LFH.

Ho2: Adult return rates, juvenile survival, and/or juvenile travel times will be the same for yearling fall chinook released from Pittsburg Landing, Captain John Rapid, Big Canyon Creek, and Lyons Ferry Hatchery. Corollary: A detectable difference in adult return rates, juvenile survival and/or juvenile travel times will be observed between yearling fall chinook released from Pittsburg Landing, Captain John Rapid, Big Canyon Creek, and Lyons Ferry Hatchery.

Assumptions: PIT tagged fish survive, travel, and return the same as fish without PIT tags. Radio-tagged fish behave and travel the same as PIT tagged or non-tagged fish.

Objective 3: Monitor and compare contribution and distribution of adult returns and smolt-to-adult survivals of yearling fall chinook released from Pittsburg Landing, Captain John Rapids, Big Canyon Creek, and LFH.

Ho3: Adult return rates to the stream of release will be the same for both the Snake and Clearwater release groups. Corollary: A detectable difference in adult returns to the origin of release will be observed between the Snake and Clearwater Rivers.

Assumptions: PIT tagged fish survive smolt-to-adult and behave the same as fish without PIT tags.

Objective 4: Prepare a cooperative annual report with the USFWS and WDFW and provide quarterly progress reports that evaluate the success of supplementation of yearling fall chinook salmon above Lower Granite Dam.

f. Methods

Objective 1.

Approach 1: Rear all fall chinook similarly at LFH at least until they are marked (September). Document rearing conditions, fish sizes, mark retention, and health at LFH, Pittsburg Landing and Captain John Rapids on the Snake River, and at Big Canyon Creek on the Clearwater River after transferring the acclimation release groups.

Task 1.1. Assist the Dworshak Hatchery Fish Health Lab in conducting weekly health assessments on a sample of 100 fish at each the Pittsburg Landing, Captain John Rapids, and Big Canyon Creek acclimation facilities.

Task 1.2. Document fish size and condition factor on fish sampled in Task 1.1 and during PIT tagging (Task 2.8).

Task 1.3. Using data from Tasks 1.1 and 1.2 compare fish size and condition of fish reared at Big Canyon, Pittsburg Landing, Captain John Rapids, and LFH.

Task 1.4. Check a representative sample of 1,500 fish for elastomer tag retention at Big Canyon Creek and Pittsburg Landing while PIT tagging (Task 2.8) and assist the WDF in checking elastomer tag retention while PIT tagging at Captain John Rapids.

Objective 2.

Approach 2: All fall chinook acclimated at Pittsburg Landing, Captain John Rapids, and Big Canyon Creek will be tagged with coded wire and elastomer tags. A representative sample of all release groups will be PIT tagged and radio tagged at Pittsburg Landing, Captain John Rapids, and Big Canyon Creek, and released at similar sizes and times as releases at LFH (approximately mid-April). Size and condition of PIT tagged fish will be evaluated during migration for fish recaptured through beach seining in the Snake and Clearwater Rivers. Outmigration survival will be estimated from PIT tag interrogations at mainstem dams using the Survival Under Proportional Hazards (SURPH) model (Smith et al. 1994). Post-release dispersal and outmigration behavior will be assessed through the use of radio tags.

Task 2.1. Radio tag 50 PIT tagged (so the fish are not barged) fall chinook yearlings each at Pittsburg Landing, Captain John Rapids, and Big Canyon Creek acclimation facilities one day prior to release and monitor post-release dispersal and movement patterns to Lower Granite and Little Goose dams.

Task 2.2. Place fixed radio receivers at the downstream end of the free-flowing stretch of the Snake and Clearwater Rivers and at Lower Granite and dam and monitor movement patterns and migration rates in the free-flowing and impounded reaches of these systems.

Task 2.3. Coordinate with the NPT, USFWS, BRD, University of Idaho (UI), and WDFW on radio telemetry equipment and data collection positions that may be shared for this study.

Task 2.4. Monitor individual fish locations by fixed-wing flights and boat and/or mobile tracking every day for four weeks after release from Pittsburg Landing, Captain John Rapids, and Big Canyon Creek to Little Goose Dam and plot locations using the Global Positioning System and detailed navigational maps.

Task 2.5. Coordinate with BRD on obtaining radio telemetry equipment from their discontinued study at Lower Granite dam in order to collect telemetry data on radio tagged yearling fall chinook.

Task 2.6. Compile temperature and discharge data in the Snake and Clearwater Rivers, and in Lower Granite Reservoir and supplement thermographs where needed.

Task 2.7. Evaluate fish distribution and travel times in relation to environmental variables (water temperature, discharge, etc.).

Task 2.8. PIT tag up to 10,000 fall chinook yearlings (2,500 X 4 replicate groups) acclimated at Big Canyon Creek and Pittsburg Landing and assist the WDFW in PIT tagging comparable numbers at the Captain John Rapids facility.

Task 2.9. Compile and analyze PIT tag detection data at all mainstem dams and compare arrival timing, mean detections dates and travel times for the fish released at Big Canyon Creek, Pittsburg Landing, Captain John Rapids and PIT tag releases at LFH.

Task 2.10. Evaluate the effect of fish size on travel time from Big Canyon Creek and Captain John Rapids to Lower Granite Dam by partitioning release fork lengths in 5 mm increments and analyze using analysis of variance (ANOVA).

Task 2.11. Use the PIT tag database compiled for Task 2.9. and the Survival Under Proportional Hazards (SURPH) model to estimate fish survival from the Pittsburg Landing, Big Canyon Creek, and Captain John Rapids releases to the Snake and Columbia River (McNary) dams and compare survival estimates to the LFH releases. Coordinate with the University of Washington (UW) and the National Marine Fisheries Service (NMFS) on running the SURPH model.

Assumptions: PIT tagged fish survive, travel, and return the same as fish without PIT tags. Radio-tagged fish behave and travel the same as PIT tagged or non-tagged fish.

Objective 3.

Approach 3: The LFH program in the past has evaluated smolt-to-adult survivals and adult contributions and distribution in the Snake River Basin. We will contribute to this effort by comparing smolt-to-adult survivals, adult distribution, and spawning contributions from yearlings acclimated and released at Pittsburg Landing, Captain John Rapids and Big Canyon Creek. We want to determine if LFH yearlings released at acclimation facilities return to the same river and general location to spawn and if they contribute to natural reproduction to help recover the species. Yearling fall chinook released at Pittsburg Landing, Captain John Rapids, and Big Canyon Creek will have elastomer tags that are distinguishable from one another and also from yearlings released at LFH. Adults returning from the acclimated releases and trapped at Lower Granite Dam will be allowed to continue upstream of the dam to spawn naturally. Spawning surveys and carcass recovery information (collected by projects 9403400 and 9801003) will provide an indication of spawning locations in relation to the acclimation release sites. Radio tagging (by project 9801003) a portion of the hatchery adult fall chinook returns to Lower Granite Dam from acclimated releases in the Snake and Clearwater Rivers will provide a better description of spawning contribution, distribution, and timing of hatchery fish and to evaluate the contribution of supplemented fish to assist in the recovery of the Snake River fall chinook. This will be a cooperative effort between the Nez Perce Tribe, U.S. Fish and Wildlife Service and Washington Department of Fish and Wildlife.

Task 3.1. Assist BPA project 9403400 (NPT) collecting adult carcasses in spawning areas on the Clearwater, Salmon, and Grande Ronde Rivers to recover CWT and elastomer data from supplementation or hatchery released fish and to gather percent spawned information to estimate spawning success.

Task 3.2. Assist the USFWS (project 9801003) in radio tagging adult fall chinook at Lower Granite and monitor adult movements in Lower Granite and Little Goose Reservoirs weekly by fixed wing flights from September 1 through the first week in December and provide locations to the USFWS for data analysis.

Task 3.3. Assist project 9403400 in conducting aerial spawning surveys on the Clearwater, Salmon, and Grande Ronde Rivers and provide locations to project 9801003 to analyze adult movements and locations of radio tagged supplementation fish.

Task 3.4. Based on the above activities, estimate the total redd contribution in the Clearwater, Grande Ronde, and Salmon Rivers by supplemented fall chinook released at Pittsburg Landing, Captain John Rapids, and Big Canyon Creek acclimation facilities and those released at LFH.

Task 3.5. Coordinate with the WDFW and USFWS in compiling the adult recovery information to estimate and compare smolt-to-adult survivals from yearling releases at Pittsburg Landing, Captain John Rapids, Big Canyon Creek, and releases at LFH.

Assumptions: PIT tagged fish survive to adult and behave the same as fish without PIT tags.

Objective 4.

Task 4.1 Provide project status reports on a quarterly basis. Quarterly reporting requirements are detailed in the BPA Terms and Conditions (Reports are due 15 days after the quarter ending December 31, 1998, March 31, June 30, September 30, and December 31, 1999).

Task 4.2. Write an annual report on the results of all objectives and tasks outlined in this statement of work and coordinate and review reports with the USFWS and WDFW to combine into a comprehensive annual report.

Task 4.3. Evaluate the success of the supplementation of LFH yearlings above Lower Granite Dam to increase natural production and assess potential impacts to natural fall chinook populations and productivity.

Sample sizes for PIT tagging are based on expected detection rates at Lower Monumental and McNary Dams from similar previous PIT tagging studies. Enough detections at these dams are essential to obtain acceptable survival estimates from the SURPH Model. Sample sizes for radio tagging are limited by our resource availability (equipment and personnel) to track fish by boat. The NPT-DFRM believes a sample size of 50 fish per release acclimation facility is minimal and that 100 fish per site is more appropriate. Presently, we barely have enough equipment and personnel to adequately track 150 fish. The funding required to cover the additional costs (boats, GPS units, laptop computers, personnel, etc.) necessary to tag and track up to 300 fish has been unavailable to this point.

g. Facilities and equipment

Two jet boats with trailers are currently available to the project from other BPA projects within the NPT, the availability of which are sometimes inconsistent. Another jet boat, specifically for this project, is to be purchased in spring, 1999. At least two operational boats are required for telemetry on the Lower Snake River reservoirs.

The project currently has one personal computer and one laptop computer with another laptop currently available from BPA project 9403400. The project needs access to two laptop computers to operate the GPS units for boat telemetry as well as the computerized

PIT tag data collection stations. The project currently has one GPS unit and BPA project 9403400 supplies another.

The project currently has two data logging and one non-logging Lotek telemetry receivers used at the fixed site on the Clearwater and Snake Rivers. Receivers for aerial and boat telemetry are currently borrowed from WDFW.

The project has one leased GSA fleet pickup truck capable of pulling the boats and BPA project 9403400 supplies a similar leased GSA fleet truck.

This project will procure one computerized PIT tagging data collection station in 1999 and two others are utilized from other BPA funded projects within NPT Fisheries. All PIT tagging equipment and fish processing/recovery equipment is provided by BPA project 9403400.

h. Budget

Personnel

The only new addition in personnel costs from 1999 to 2000 is the addition of a two month biological aide position and one pay period for administrative support (Fisheries Research Coordinator). In previous years personnel have been shared between this project and BPA project 9403400. Project 9403400 has hired a biological aide in the past but will not be this year. Since the aide is necessary to complete field work during the spring yearling outmigration, the position was added. All other increases are to accommodate salary increases.

Fringe Benefits

The NPT has a significant number of tribal members employed in the DFRM who are tax exempt status. This is the reason for two different fringe benefit rates.

Supplies, Materials, Non-expendable Property

Office supplies and field materials funding is unchanged from 1999. Office supplies include postage, photocopies, cost-shared a/v equipment, and miscellaneous office supplies such as envelopes, pens, etc. Field materials funding includes such items as materials to construct a station for mass PIT tagging, miscellaneous telemetry materials (masts, cable, etc.), and new and replacement PIT tagging gear (syringes, needles, etc).

Operations and Maintenance

Office rent, utilities, and telephone services funding remained unchanged from 1999. GSA vehicle and mileage rates increased due to upgrading vehicles. The project had a Ford Ranger incapable of towing the boats we use on the project. This replacement vehicle is a one ton crew cab pickup fully capable of performing the towing requirements of the project. Boat gas and maintenance increased 2.5% from 1999. This increase was due to the project having one jet boat of its own rather than borrowing both. Maintenance costs to this project will increase slightly since we will be responsible for all maintenance costs rather than only when we borrow a boat. Training costs decreased

from $600 in 1999 to $250 in 2000. Training will be first aid/CPR certification and some computer training courses.

Capital Acquisitions

Coded radio tags are an integral part of the monitoring and evaluation of yearling fall chinook as shown above. Individual tag price increased slightly from 1999 to cover shipping and handling costs and a tag price increase. The project has one personal computer for the project leader. The project biologist is currently working off of a laptop in the office which is inadequate. The laptop is limited in speed and memory and is also often unavailable because it is being used in the field.

PIT Tags

The work plan for this project calls for 10,000 PIT tags per acclimation facility. This tag number was selected to have sufficient detections at the lower Snake River Dams and McNary Dam to produce reliable survival estimates. This project provides PIT tags for Pittsburg Landing and Big Canyon Creek while WDFW provides PIT tags for the Captain John Rapids facility.

Travel

Travel costs are based on ten days of travel to various fall chinook coordination meetings and annual project reviews and symposia. The majority of the coordination travel will be within driving distance and be either one long day or short overnight trips. The per diem rate is an estimate just below the daily federal government rate as some travel days are only partial and not reimbursed the full daily rate. Field per diem is self explanatory. The project field crew occasionally stays overnight in the field during yearling boat radio tracking.

Indirect

The indirect rate is unchanged from 1999 to 2000.

Subcontractor

Fixed wing radio tracking flight rates increased only slightly from 1999 to 2000. The per flight rate for yearling tracking increased by $50 per flight based on the average hours per flight in 1998. Adult flight tracking rates remained the same from 1999 to 2000.

Section 9. Key personnel

Steve Rocklage is the Project Leader with Dale Kellar as Project Biologist. The Project Leader oversees Project 9801004 Monitoring and Evaluation of Lyons Ferry Hatchery Fall Chinook released upstream of Lower Granite Dam. The Project Leader coordinates fall chinook salmon research with the Bonneville Power Administration, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Forest Service, Washington Department of Fisheries, Oregon Department of Fish and Wildlife, Idaho Department of Fish and Game and other agencies as required. The Project Leader is responsible for administrating Bonneville Power Administration contracts and conducting evaluation studies for the Nez Perce Tribe including development of budgets, plan of operation,

monitoring expenditures, statements of work, reporting and coordinating office and field work with management staff. The Project Leader is also responsible for maintaining written records of interactions with funding agencies, reviewing agencies and co-management agencies, write and publish meeting, progress and annual reports, maintain a database, correspond orally and in writing with supervisory staff and co-management agencies. The Project Leader provides management, training and supervision of full time and temporary personnel for conducting the yearling fall chinook monitoring and evaluation studies.

Project Leader: Stephen J. Rocklage

EDUCATION:

University Of Idaho, Moscow, ID. 1991-1995. Completed M.S. studies in Fishery Resources.

Southern Illinois University, Edwardsville, IL. 1985-1990. B.S. Degree in Biological Sciences.

EXPERIENCE:

Nez Perce Tribe, Lapwai, ID. 7/95-Present. Fisheries Research Project Leader. Currently Project Leader for Monitoring and Evaluation of Yearling Snake River Fall Chinook Outplanted Upstream of Lower Granite Dam (BPA Project 9801004). Project Leader for one year on Imnaha River Smolt Monitoring Program (Fish Passage Center Project). Fisheries Production Assistant for 6 months for the Lower Snake River Compensation Plan.

University Of Idaho, Moscow, ID. 1/93-7/95. Fisheries Research Technician.

Idaho Department Of Fish and Game, Eagle, ID. 6/92-12/92. Fisheries Research Technician.

Union Electric Company, St. Louis, MO. 6/90-12/90. Assistant Fisheries Biologist.

PUBLICATIONS:

Blenden, M.L., S.J. Rocklage, and P.A. Kucera. 1997. Spring Outmigration of Wild and Hatchery Chinook Salmon and Steelhead Trout Smolts from the Imnaha River, Oregon, February 23-June 24, 1996. Annual Report – 1996. U.S. Department of Energy - Bonneville Power Administration. Portland, Oregon.

Jay Hesse is the Research Coordinator for the Grande Ronde Supplementation Monitoring and Evaluation portion of this project. Mr. Hesse has five years professional experience as a Fisheries Research Biologist and as the Research Coordinator. He is responsible for the technical direction and supervision of fisheries research division projects, research coordination, and research representation at state and federal meetings. This position fills 0.05 FTE.

Education: Bachelor of Science, 1992 Michigan State University
Major: Fisheries and Wildlife
Master of Science, 1994 Michigan State University
Major: Fisheries

Paul Kucera is the program leader for the Grande Ronde Supplementation Monitoring and Evaluation portion of this project. Mr. Kucera has 23 years professional experience as a Fisheries Biologist in research, management and administration and is a Certified Fisheries Scientist through AFS. He has authored or co-authored seven peer-reviewed fisheries journal publications and over 40 project reports. Responsible for technical program direction and administration of the Fisheries Research Division. This position fills 0.1 FTE.

Education: Bachelor of Science, 1975 Utah State University
Major: Fisheries Management
Completed MS studies, 1990 University of Idaho
Major: Fisheries Management

Section 10. Information/technology transfer

We will write an annual report on the results of all objectives and tasks outlined above and coordinate and review reports with the USFWS and WDFW to combine into a comprehensive annual report which will be submitted to BPA and published. Oral and/or poster presentations will be delivered when appropriate.

Congratulations!